



LUND
UNIVERSITY

MSc in Membrane Engineering for Sustainable Development

ERASMUS MUNDUS JOINT MASTER'S DEGREE

- Master of Science in Membrane Engineering for Sustainable Development
- 2 years, full-time, 120 ECTS credits
- Erasmus Mundus Joint Master's Degree
- Université de Montpellier (coordinating organisation), Université Toulouse III-Paul Sabatier, University of Chemistry and Technology Prague, Universidade Nova de Lisboa, Universidad de Zaragoza, University of Twente, Lund University
- Application deadline: www.mesd.edu.umontpellier.fr/
- Programme start: www.mesd.edu.umontpellier.fr/

PROGRAMME OVERVIEW

Most likely, every person uses or comes in contact with a product processed by membrane technology on daily basis, whether it is the drinking water, gelatin in sweets, enzymes in washing powder, vaccines against diseases or the milk, wine and beer we drink to name just a few examples. With huge impacts on the day-to-day life of ordinary people, membrane engineering has remodeled separation technologies.

The Master's programme in Membrane Engineering for Sustainable Development (MESD) offers an advanced education related to membrane science and engineering at the interface between material science and chemical engineering. The master's curriculum is oriented to favor the employability of graduates in industry or academia by focusing on key professional skills related to membrane materials, membrane engineering and project management. Graduates will be able to address environmental and sustainability challenges and provide effective membrane-based solutions in the fields of energy, food, bio, health, and water.

MESD is operated by seven higher education institution in six European countries. Students will study in at least three of the following universities:

- Université de Montpellier (France), coordinating organisation, UM
- Université Toulouse III-Paul Sabatier (France), UT3

- University of Chemistry and Technology Prague (Czech Republic), UCTP
- Universidade Nova de Lisboa (Portugal), NOVA
- Universidad de Zaragoza (Spain), UNIZAR
- University of Twente (Netherlands), UTwente
- Lund University (Sweden), LU

Associated partners:

- Università della Calabria (Italy), UNICAL
- Catholic University of Leuven (Belgium), KUL
- Consiglio Nazionale delle Ricerche (Italy) (CNR)

This comprehensive programme takes into account the excellence areas of each partner and allows the students to acquire the basics of membrane engineering as well as to be specialized in a chosen field. Summer schools and weekly seminars complete the curriculum.

PROGRAMME MODULES/COURSES

The programme has three tracks during the first academic year (semester 1 and 2) focusing on scientific and transversal skills. In semester 3, the programme offers three tracks in membrane application fields related to sustainable development and the environment. Semester 4 is reserved for the Master's thesis.

Semester 1–2, tracks:

- Membrane materials (semester 1 at UM, semester 2 at UNIZAR)
- Membrane chemical engineering (semester 1 at UT3, semester 2 at UCTP)
- Membrane technologies and project management (semester 1 at UNIZAR, semester 2 at UCTP)

Semester 3, tracks:

- Energy – oil and gas (UTwente)
- Food, bio and health – food and beverage processes, pharmaceutical and medical applications (NOVA)
- Water – water and wastewater treatment (LU)



”Membrane technology is one of the fastest growing separation technologies worldwide! The applications of membrane processes range from the medical and pharmaceutical to the food and beverage industry, and includes biorefineries as well as drinking water preparation and wastewater treatment. Based on this, membrane engineering can contribute significantly to achieve several of the UN sustainability goals. The Master's programme, organised by some of the leading universities in Europe on membrane research, provides the unique opportunity to immerse into this exciting field with future prospectus for both industrial and academic careers.”

Frank Lipinizki, MESD Local Coordinator at Lund University



Semester 4:

Master's thesis at any of the partners.

Sustainable development elements are included in each track. All tracks will allow students to integrate into the local academic universe and local industry. Depending on the choice of mobility throughout the programme, students can obtain at least three degree certificates.

CAREER PROSPECTS

The global membrane separation technology market is currently passing through a high growth phase, catalysed by a steadily increasing demand from both municipal and industrial sectors, and it is currently around EUR 30 billion (2024) with an average annual growth rate of 6 – 8 %. To the traditional top players (e.g., The DuPont-USA, Veolia – Suez – France, Toray Industries-Japan, Asahi Kasei Corporation-Japan, etc.) are now added newcomers from China, and other Asian countries thus expanding the need of well-educated membrane engineers. Furthermore, this picture covers only the municipal and industrial sector; membranes have also entered the medical

market with Baxter Healthcare, previously Gambro, as one of the key players.

In Lund alone, there are several companies e.g. Alfa Laval, Baxter Healthcare, TetraPak, Purac and Sweden Water Research working with membrane technology. Employment possibilities for graduates further expand when including the Copenhagen area with companies like Aquaporin, Arla Food, BWT, Cembrane, Liqtech, Novonesis and Novo Nordisk. The Membrane Group in the Department of Chemical Engineering has close contracts with these companies and has collaborated with them in the past. After successful completion of the programme, students will have great opportunities to join either industry or pursue an academic career in membrane research in Sweden or elsewhere.

ENTRY REQUIREMENTS AND HOW TO APPLY

See <https://mesd.edu.umontpellier.fr/> for detailed application instructions, application forms and deadlines.

Tuition fees

See <https://mesd.edu.umontpellier.fr/> for details on tuition fees and scholarships.



Funded by
the European Union



Membrane Engineering for
Sustainable Development

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www.mesd.edu.umontpellier.fr/

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Lund University was founded in 1666 and is repeatedly ranked among the world's top universities. The University has around 47 000 students and 8 800 staff based in Lund, Helsingborg and Malmö. We are united in our efforts to understand, explain and improve our world and the human condition.

Learn more at www.lunduniversity.lu.se



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